

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

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PCT

NOTIFICATION OF TRANSMITTAL OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of Mailing
(day/month/year)

15 JUN 2004

Applicant's or agent's file reference

325.0201PCT

IMPORTANT NOTIFICATION

International application No.

International filing date (day/month/year)

Priority date (day/month/year)

PCT/US03/23369

24 July 2003 (24.07.2003)

14 January 2003 (14.01.2003)

Applicant

FLUOR CORPORATION

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices)(Article 39(1))(see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/US

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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

REC'D 17 JUN 2004

WIPO PCT

Applicant's or agent's file reference 325.0201PCT	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US03/23369	International filing date (day/month/year) 24 July 2003 (24.07.2003)	Priority date (day/month/year) 14 January 2003 (14.01.2003)
International Patent Classification (IPC) or national classification and IPC IPC(7): G01N 29/04 and US Cl.: 73/622, 627; 310/336		
Applicant FLUOR CORPORATION		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

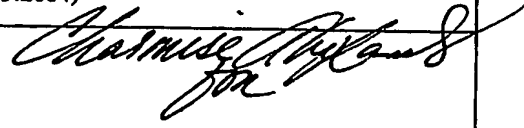
2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☒ Non-establishment of report with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 21 January 2004 (21.01.2004)	Date of completion of this report 21 May 2004 (21.05.2004)
Name and mailing address of the IPEA/US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer  John E Chapman Telephone No. (703) 308-0956

I. Basis of the report**1. With regard to the elements of the international application:***

- ☐ the international application as originally filed.
- ☒ the description:
pages 1-16 _____ as originally filed
pages NONE _____, filed with the demand
pages NONE _____, filed with the letter of _____.
- ☒ the claims:
pages NONE _____, as originally filed
pages NONE _____, as amended (together with any statement) under Article 19
pages NONE _____, filed with the demand
pages 17 and 18 _____, filed with the letter of 22 April 2004 (22.04.2004)
- ☒ the drawings:
pages 1-4 _____, as originally filed
pages NONE _____, filed with the demand
pages NONE _____, filed with the letter of _____.
- ☐ the sequence listing part of the description:
pages NONE _____, as originally filed
pages NONE _____, filed with the demand
pages NONE _____, filed with the letter of _____.

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages NONE
- ☐ the claims, Nos. NONE
- ☐ the drawings, sheets/fig NONE

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International Application No.

PCT/US03/23369

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The question whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been and will not be examined in respect of:

☐ the entire international application,

☒ claims Nos. 13-22

because:

☐ the said international application, or the said claim Nos. _____ relate to the following subject matter which does not require international preliminary examination (*specify*):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. _____ are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. _____ are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for said claims Nos. 13-22

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. STATEMENT**

Novelty (N)	Claims <u>1-12</u>	YES
	Claims <u>NONE</u>	NO
Inventive Step (IS)	Claims <u>1-12</u>	YES
	Claims <u>NONE</u>	NO
Industrial Applicability (IA)	Claims <u>1-12</u>	YES
	Claims <u>NONE</u>	NO

2. CITATIONS AND EXPLANATIONS

Claims 1-12 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest an ultrasonic test apparatus for polymeric materials comprising a low-absorption housing at least partially enclosing an ultrasound transducer that emits a low frequency wide angle ultrasound beam having a narrow bandwidth. As used by applicant, the term "low-absorption housing" refers to a housing exhibiting no more than about 25 % of a housing fabricated from high-impact polystyrene (page 6, lines 19-24), "low frequency" refers to a frequency between about 0.5 MHz and 10 MHz (page 7, lines 6-8), "wide angle" refers to a beam typically between 30-80 degrees (page 7, lines 9-16), and "narrow bandwidth" refers to a bandwidth within about 25 % of the nominal frequency of the transducer (page 7, lines 19-22).

Claims 1-12 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

----- NEW CITATIONS -----

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

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VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

The drawings are objected to under PCT Rule 66.2(a)(iii) as containing the following defect(s) in the form or content thereof: The drawings do not admit of direct reproduction (Rule 11.13).

NOT 2A AADT

CLAIMS

What is claimed is:

1. An ultrasonic test apparatus for polymeric materials comprising a low-absorption housing at least partially enclosing an ultrasound transducer that emits a low frequency wide angle ultrasound beam having a narrow bandwidth.
2. The apparatus of claim 1 wherein the low-absorption housing comprises high-impact polystyrene.
3. The apparatus of claim 1 wherein the low frequency is between about 1 MHz and about 5 MHz.
4. The apparatus of claim 1 wherein the ultrasound beam is emitted at a beam angle of between about 30 degrees and about 80 degrees.
5. The apparatus of claim 1 wherein the bandwidth is about $\pm 10\%$ of the low frequency.
6. The apparatus of claim 1 wherein the housing comprises high-impact polystyrene, and wherein the low frequency is about 2.25 MHz at a bandwidth of about $\pm 10\%$.
7. The apparatus of claim 6 wherein the ultrasound beam is emitted at a probe angle between about 30 and about 80 degrees, .
8. The apparatus of claim 1 wherein the polymeric material comprises a high impact resistant polystyrene.
9. The apparatus of claim 1 wherein the polymeric material is selected from the group consisting of high-density polyethylene, polypropylene, and polyvinylidene fluoride.
10. The apparatus of claim 1 further comprising an ultrasound receiver in pitch-catch arrangement with the transducer, wherein the ultrasound receiver produces a signal.
11. The apparatus of claim 10 wherein the signal is processed using a signal processing software that translates the signal into a visual output.
12. The apparatus of claim 11 wherein the visual output is displayed on a portable device that is electronically coupled to at least one of the transducer and ultrasound receiver.
13. A method of marketing an ultrasound test apparatus, comprising:

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providing an apparatus that has a low-absorption housing at least partially enclosing an ultrasound transducer, wherein the transducer emits a low frequency wide angle ultrasound beam having a narrow bandwidth; and

providing information that the apparatus is useful in detection of a flaw in a polymeric material.

14. The method of claim 13 wherein the housing is fabricated at least in part from high-impact polystyrene, and wherein the low frequency is between about 1 MHz and about 5 MHz.
15. The method of claim 14 wherein the ultrasound beam is emitted at a beam angle of between about 40 degrees and about 70 degrees, and wherein the bandwidth is about $\pm 10\%$ of the low frequency.
16. The method of claim 15 wherein the ultrasound beam is emitted at a probe angle of about 60 degrees.
17. The method of claim 16 wherein the polymeric material is selected from the group consisting of high-density polyethylene, polypropylene, and polyvinylidene fluoride.
18. The method of claim 13 wherein the flaw is selected from the group consisting of an inclusion, porosity, a lack of fusion, and a fracture.
19. The method of claim 18 wherein the information further includes advice that the lack of fusion is detected by a loss of at least one of a back wall echo and a lateral wave.
20. The method of claim 13 wherein the information further includes advice that the apparatus will detect the flaw in the polymeric material, when the polymeric material has a thickness of up to 4 inches.
21. The method of claim 20 wherein the flaw has a size of less than 4% of the thickness of the polymeric material.
22. The method of claim 21 wherein the polymeric material comprises a butt weld of two pipes.